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GEOGRAPHICAL CHANGEABLENESS. SOME CHARACTERISTICS AND VALUES.[1]

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THIS Journal has published during the past year many articles[2] which discuss, and offer suggestions along the line of what a child should know as the result of a primary and grammar school training in geography. The authors have furnished us with helpful summaries. In a discussion of any plan of this nature, three factors must be recognized. These are the child, the course of study and the teacher. The writers have eliminated the real child by assuming a normal pupil. Consequently their plans for improvement are concentrated on the course of study and the teacher. Courses of study do not as a rule limit a teacher's power or harass her individuality. And, after all, the outline is only the safeguard, the thing that keeps the teachers on the track and running in the same direction. In the last analysis, it is the teacher's partiality towards special parts of the subject and her more intimate knowledge of one topic than of another, that determines the weight of the instruction. Apart from the stress of impending examinations which her pupils have to face, when courses are paced for immediate results and not for lasting ones, the teacher is a free agent.

In this discussion, three correlative propositions are to be kept in mind; that some things cannot be taught young children; that many things are better not taught them; and that, owing to their limitations (undeveloped minds) and to the teacher's limitations of time, some phases of the subject matter must be imperfectly or erroneously understood. The bounds of our subject may be stated inclusively, as was the plan of the writers in the April Journal. It may be stated exclusively, by defining contiguous subjects and

[1] An address delivered before the Worcester County, Mass., Teachers' Association and rearranged for publication in this Journal.

[2] See especially, *Journal of Geography* IV, 4, April, 1905.

considerations which have been declared unnecessary in the development of the child's mental state. A selection of subject matter, if it is the result of deliberation, implies that many things have been considered and a few chosen. The items discarded must have been rejected for a reason. A teacher who follows a course of study in geography and does not know why the outline was so constructed nor the cause of the many seeming omissions is not working in the light. There is as much difference between the spirit and the letter of a school course as between the spirit and the letter in the Mosaic decalog. "Thou shalt not" plus conscience or reason developed into "thou shalt." A course of study, balanced and proper, arranged for any single grade, cannot be adequately followed by one ignorant of the considerations on which the judgments were based. Many of the items that appear in the outline may often disclose their worth through an understanding of numerous quasi-important items.

The question as to what a child should know does not seem to be answered by listing certain precepts and relationships and conditions. There is more to geography than can be compassed in such a census. If the writers assumed not only a normal child but also a capable teacher the weignt of the discussion might then fall upon the outline. Our paidology is fast providing plans for the deficient children and steps are being taken to provide special accommodations of mind and time for them. We may then eliminate the child from the discussion on the assumption stated above. It is inevitable that the light of approaching days should bring out new relations in the subject matter of geography. In this increasingly better view we are hopeful that a constant improvement in outlines will always be in vogue. As this knowledge comes to the teachers, if it is knowledge and conviction based upon a broad outlook, a social and a reasoning world demands that it be presented to them not in the shape of commands to be obeyed, but as an issue to be weighed. With this rapid dismissal of two of our factors, let us turn our attention to the teacher, the third factor in the discussion. I have already inferred that the interpretations of an outline may have a wide range according to the inclination of the teacher or the interest incited in her by certain topics. It has been the case in times past that teachers of limited knowledge, maintaining views that are not accepted to-day, have nevertheless been teachers in the larger sense. They impressed their personality upon their pupils and were broader and better than the things they taught. Here and there, such teachers are extant. We call them of the old school. However, it is not a safe policy for the teachers of to-day to trust too implicitly in their own personality or to allow their knowledge to wane into eccentric conviction. Nor is it a wise decision for a teacher to

decide once for all on the line of her effort. It is better for the teacher to acknowledge the changeableness of geography and as new theories, new facts, new methods and new considerations arise, to be in such a rational mood as to absorb gradually and easily the things that are of value. It is better to grow into the new ideas by constant modifications, than by clinging to the old, to find later that our knowledge is discountenanced, that it must be discarded to a large degree and something altogether strange must be adopted. Under the last supposition, it seems almost useless to learn at all. I have heard teachers voice this sentiment in the face of new discoveries and new theories.

Let us turn in another direction. We are told to-day that the period of infancy which in man is longer than in animals is of vast significance, "and a man's characteristics at various ages are more largely due to modifications produced by his own and less to race experience than is the case with any other animal."[1] And all this in order that he may adapt himself to his condition in life or that he may enjoy a plasticity of physical and mental being, whereby changing methods in life and varying lines of philosophy and science may be realized by him. If this is so, then one of the aims of education should be to develop a faculty of adaptation that will give a new idea a welcome and an opportunity of eliciting a reasonable response. To learn and to be able to locate the cities of the earth is a task which the athletic memory of a child easily overcomes. This knowledge may be retained because of what we call a good memory or because the mental process becomes habitual by means of repetition or drill. Soon, however, such knowledge may lose its value. Some unessential feature, as the rhythm or rhyme or even the inflection, is often the basis of this special act of memory; like a tune which is not easily taken up at a subordinate measure but which once begun is often carried to a successful conclusion. Thus the knowledge becomes a memory chain, a pathway of narrow width, and all the data therein become encased in a setting. The independent facts cannot be readily used, apart from their associate ideas. And what is worse, if there comes a time when a shifting of the values occurs, and such a memory scheme is relied upon, there is no provision in this method to meet such a condition of affairs. These are some of the steps that lead us to believe that our geography teaching should be something more than an exercise in memory and a drill. Apart from that value in the study of geography which adds to the sum of human happiness through the channels of general intelligence, I should place the greatest weight on the training that comes from classifying and cataloging in one's mind the panoramic scenes of the earth as the years unroll the canvas.

[1]Fitzpatrick. *Fundamentals of Child Study*, p. 6.

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Geography has suffered and is suffering still from an ossifying of many parts that should remain supple. Stories are told, illustrations are used, theories advanced and conclusions inferred with a precision and a constancy that is disastrous, first to the teacher and finally to succeeding grades of pupils. The teacher's part in this changing geography lies in such a desire to freshen her foundations that a constant achievement results. The time that is spent in studying and memorizing certain unessentials could be more profitably spent in this direction. There is enough in literature that is valuable to satisfy the demands of memory training, and the accession is a greater addition to one's education than the variable facts of geography. With volumes of statistics published yearly, we can now ease our memories by carrying, if we judge such items indispensable, a small volume of geographic information in the vest pocket.

It may be useful to teachers to know what pupils have learned and are learning. The process here is to compare the recent past with the present. In a subject growing with rapidity there may be greater error in such a proceeding than in a subject of slower and more stable growth. It is, however, possible to obtain results with a degree of accuracy where neither the teacher's method nor the outline has been altered beyond an accountable quantity. If the graduates of the schools are in unison in regard to certain precepts, if the same illustrations are used in explaining principles of wind movement or the government of states, if the same trite expressions come naturally to many lips in defining, and if the same erroneous conclusions are drawn from given specific causes, it is reasonable to believe that the sources of information—books, or teacher or teacher's teacher—have been the same. We must always have in view that the pupils of teachers become the teachers of pupils of the third generation. If the process of teaching is merely that of transmission there is danger of falling behind. I am not in a pessimistic mood. I do not believe that the teachers teach what was taught them, following the method of presentation and the manners in general of former preceptors. While I do not believe that such things are done in general, I am forced to believe that in specific parts of a subject this manner of teaching is operative. These parts are diminishing in number; some of them however will only die with the generations. In view of many items now suffering from what may be termed the momentum of the favor of past teachers, I desire the teacher of the present carefully to scrutinize her foundations.

One of the tests of the great art in a teacher, one of the marks of genius, is the balance of any presentation. It is no easy task to present a story to a child mind and have the emphasis on the right part. It is a common ex-

perience that a minor detail often catches the child's attention and becomes the pivot of the story. In a class of children it is almost axiomatic that some minds will stray away and make for themselves a new emphasis based on some previous conception. In the apperceptive process the teacher may give the new experience, but in its adjustment with the old in the child's mind, she is responsible only so far as the pre-existing ideas are the results of her work during the previous weeks and months. As the child advances in the grades, the teacher's power and part in the apperceptive process becomes more marked because of the increase in the number of ideas emanating from her. "And it may well solemnize a teacher, and confirm in him a healthy sense of the importance of his mission, to feel how exclusively dependent upon his present ministrations in the way of imparting conceptions the pupil's future life is probably bound to be."[1]

I have carried on, rather surreptitiously, for a number of years an investigation of certain ideas in the minds of the products of our schools, teachers and otherwise, and I feel that there is need of some investigation by teachers in general along the line of their commonplace stock in trade. There is danger as the years go by in a teacher's experience, unless she strives at all hazards to overcome it, that her expressions and teachings become petrified, not in all lines, not even in one line perhaps, but in a few subordinate particulars. Therefore I urge that year by year a few of our general precepts and laws as they have been conceived and as they have been voiced, be subjected to a rigorous overhauling.

Following are a few examples of what I have in mind; they are along the line of a misdirected use of the superlative and a tendency towards superficial and not thoughtful deduction.

There is, I feel, in the minds of many graduates of our schools a too extravagant notion in regard to climates. As the various states and nations are studied, the idea conveyed in the use of the term "hot climate" is unduly exaggerated. Among many older persons there is almost a dread of traveling lest other climates be less salubrious than their own. I have seen teachers who vibrated in so sympathetic a strain with their teaching that when a "hot climate" was described, they showed evident signs of discomfort in their expression, and I can almost believe that they were in some danger of a sunstroke. The word "hot" in the apperceptive process in the child may mean the stove she or he so unguardedly touched. It seems almost impossible not to overstep the bounds and yield a notion of excessive discomfort and danger, at all times and in all places, in what is termed the hot belt in the beginnings of our teaching, but a more tempered notion should be

[1] James. *Talks on Psychology and Life's Ideals*, p. 168.

gained before the child leaves the grammar school. It may be only paucity of vocabulary that makes a child of ten say that the climate of Bombay is so hot that the inhabitants have to live elsewhere. In the process of time the pupils should discover that heat is not the worst feature of tropical countries, and more often than we are inclined to believe the heat is not unbearable. The zonal classification of the earth into heat belts on which we are apt to base our knowledge of climates is in some degree responsible for the misapprehension. These things we know; that the latitudinal division of the earth into zones is based on light and not on heat; that other factors influence the temperature besides distance from the equator; that the expression "torrid zone" is not in good repute with a large class of teachers; and that the term "hot belt" cannot be applied simply, inclusively and carelessly to sub-equatorial and tropical domains.

To classify places as healthful and unhealthful is not always judicious. Conditions which tend towards the spread of diseases may be of geographical importance or they may not be. The story is one of larger import. Mankind may rise above most factors on the earth but he can scarcely hope to be greater than climate. Like the vegetation he is limited in his range. The races have their zones of best development, and deterioration and sparsity characterize them as they spread toward the warmer and cooler, or wetter and drier states. Men will doubtless ever go to all parts of the earth to live and will perhaps rear families there, but races probably will not. All else in the story of healthfulness is embraced in very special and sometimes minute conditions; conditions often within the power of man to control. Apart then from the race adaptation, the story of Benares or of Nigeria is only the story of Washington, or of New Orleans.

Another illustration may be found in the Gulf Stream. This oceanic stream and the oceanic drifts are working overtime. Maps are published black with arrows which show the direction of these drifts, and one becomes dizzy, almost, as he beholds the apparent vortexes. By nearly every teacher and pupil who has come within my range of knowing there is held an exaggerated idea concerning the Gulf Stream. I have asked teachers and pupils to estimate for me the time that they think it takes for the so-called Gulf Stream to pass from Hatteras to the British Islands. The results are as follows: two weeks is the answer of the majority, and the maximum and minimum averages respectively two months and one week. One of the classic examples in algebra reads, "A boatman rows 20 miles down a stream and back in 8 hours. He finds that he can row 5 miles down the stream in the same time that he can row 3 miles up the stream. Find the time he was rowing down and up respectively." Under the heading "Fastest Atlantic

Ocean Passages" in the World's Almanac for 1905 are chronicled nineteen record trips ranging from 5 days 7 hours 23 minutes to 8 days 22 hours 13 minutes. Of these nineteen, eight are from transatlantic ports to American ports. The best record is by the steamer Lucania of the Cunard Line from Queenstown to New York in 5 days 7 hours 23 minutes and the second best record is accredited to the same steamer running from New York to Queenstown in 5 days 8 hours 38 minutes. In other words there does not seem to be a severe hindrance offered to transatlantic steamers in sailing against this over-rated stream. What may be gleaned from these records in the way of difference can be accounted for by the prevailing winds. If we apply the algebraic problem to the steamship records, neither of which I am upholding as an absolute verity, there must come over a thoughtful person some wonder at the great discrepancy between the figures and the popular notion. Teachers and others look for the Gulf Stream when they voyage as tourists to other shores, and by means of their faith and their imagination they see the dark green color that betokens an oceanic river. All sorts of changes and conditions are accredited to this drift and to similar drifts in other seas. The influence of this so-called stream upon European living is a common exaggeration. Redway writes, "In this respect (as modifiers of climates) their (oceanic drifts) effects are inconsiderable, and Western Europe could worry along very well without the Gulf Stream, so far as temperature is concerned."[1] Gannett cites[2] the Gulf Stream idea as one of the persistent errors in geography. A teacher taught that "The cause of our cooler summers is the eruption of Mt. Pelée which turned the Gulf Stream from its course." Whatever else we may believe concerning this last quotation, we must admit that it contains some weight of evidence towards the acceptance, as true, of three not proven doctrines; the theory of changing seasons, one of the superstitions of the race; the relative value of eruptive disturbances; and the Gulf Stream mania. A study of the charts of the Oceans published by the Hydrographic Office of the Navy Bureau may yield some interesting information.

The customs, observances and the like of people distant in place and in habits of mind may be treated more profitably than is often the case. If the aim in studying other lands than our own is self-glorification then many teachers are doing good work. A study of other peoples, to be fruitful, must awaken in the student a sympathy and a feeling of neighborliness. The ties between nations must be made stronger, not severed. To uphold the customs of the Chinese as curious because they are unlike our own, defeats the broader view. The antithesis is unworthily used. Customs are the

[1] *The New Basis of Geography.* p. 129.
[2] *Journal of Geography* I, 4, 1902, 155.

process of generations and the point of view should always be that of the actor. To an outsider many of our own actions must appear incomprehensible. "Women when going into the drawing room of the Queen Victoria regard a bare skin as a mark of respect." Thus writes a Chinese traveler. "A European skipping match (meaning the dance) is a strange sight." Such stories as the Seven Little Sisters induce a healthy attitude towards our neighbors on this earth. It is a distinct step in the other direction that geographical readers for later grades have chapters on "Curious Customs." I would not denounce the Chinese women nor marvel at her barbarities for bandaging her feet as long as our own women constrict their waists; with the Psyche knot and the rat we do not have to go to Africa to see headdress to talk about; we are not so far from earrings to turn our shafts towards nose rings and the like; and the petty subdivisions into castes and orders, which in many instances have a basis of faith abroad, have not even that saving virtue at home. In other words it is better for the pupils both from an ethical and a material standpoint, to find things to criticise in themselves in a hope of improvement, and to seek for things to enjoy, without arrogance or conceit, in their neighbors. In Stoddard's Lectures[1] we read:

"A Chinese youth, after eating for the first time a European dinner, wrote of his experience: 'Dishes of half-raw meat were served, which pieces were cut with sword-like instruments and placed before the guests. Finally came a green and white substance, the smell of which was overpowering. This, I was informed, was a compound of sour milk, baked in the sun, under whose influence it remains until it becomes filled with insects; yet the greener and livelier it is, the greater the relish with which it is eaten. This is called CHESZE.' "

The time is ripe for saner teaching in this direction. We claim our civilization as the acme. The Chinese say that centuries ago they did great deeds and carried to completion extensive engineering plans, and that they are the heirs of the ages. Is it a case of the mote that is in our brother's eye and the beam that is in our own? Race questions are delicate matters today. We should not teach race divisions on the earth simply because a chapter in the geographies is so headed. We may take the ground that there are Greeks and Barbarians, or we may hold the opposite theory. At all events there is an opportunity here for such careful consideration as has not been given in any extensive way of the value of this subdivision of our subject.

These are some of the items where broader considerations are possible.

[1] John L. Stoddard's Lectures, China, p. 321.

The examples have not been exhausted. Many, if not most, of the material in geographic study is open to further search, in the thing itself, in the manner of presentation, or perhaps in both of these lines. Theories are often based on very rudimentary knowledge. Conclusions may be safely drawn from facts; but the children of theories are inferences. If our geography includes some theories and therefore some inferences, we ought to be able to differentiate between these and the tenets which are true. If the theories change, the inferences from them must be made anew. The old should be erased and a brand new set formulated. As our increasing knowledge exposes new conditions, and hitherto unknown facts become the property of us all, the theories are moulded more and more into their proper shape by the additional array of things known. If we are seekers after the truth, we should not cry out because this changeableness is found in the theories of our creed. It is one of the essentials of mental activity that we keep our minds plastic, ready to grasp and absorb the new that is of worth. In this lies the advantage of the rational geography. We are not rearing mummies or phonographs. I am not asking, moreover, the teachers to run after unknown gods nor do I care to have them carried about by divers and strange doctrines. I do urge them to emancipate themselves from superstitions. It has been said that savage races, by an excessive and vehement fancy, are continually and irresistibly led away from the path of science into the wilderness of superstition. We are not so many generations away from our pristine state that the tendency has been eradicated. I do not wish to impose additional burdens upon the teachers, but it is not unfair to ask that an investigation of some of the basal notions of geography be undertaken at certain rather infrequent periods, and the light which has been shed upon them since last they were placed in the glare of careful scrutiny, may expose defects which are to be avoided and yield new truths by means of which a larger outlook may be gained. This changing view is an expectable quality. If we aspire to greater heights, we must be prepared for a broader horizon.

There is often an endeavor in teachers to explain everything. In a superficial way it is supposed to be her business. Not to know seems a refutation of her position. Some attempts at explanation have led to grievous errors. There are many things in geography that are not yet definitely known. These things arise in our everyday lessons. To avoid their problems is to lose an admirable feature of geographic training; to fix their present status in the mind of a child as an unchanging verity, is a policy that caters to the present limited scope rather than to the possibilities of future vision. If we are, as we say we are, training for the future, what is to be is of more value than its present undeveloped entity. Teachers,

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however. are not prophets. They cannot know what the future will unfold. But if they know that progress dictates, they must feel that some, if not most of the considerations that they are now presenting will probably be viewed in a stronger light by the growing generation before its day is done. They must ever be on the alert to catch the message of change and be watchful of the signs which indicate the path of progress. The idea of change should be one of paramount importance in their teaching. This idea cannot be taught unless it is felt. It cannot be felt unless it is in use. If my reasoning is not at fault, my demand that teachers have a constantly growing knowledge of geographic items is just.

My conclusion reiterates my former statement. If we are in sympathy with the spirit of growth, called evolution—and we should be in this day—there is a value accruing in our study of geography; a value that has not up to this time been accorded its fullest recognition.

THE RELATION OF GEOGRAPHY AND HISTORY

One of the more satisfactory utterances on this subject is found in the report of the history conference to the committee of ten, as follows: "From the beginning the teacher should attempt to connect physical geography with the present political condition of the world, and, in like manner, the study of political geography should constantly bring in the physical features." Even more emphatic is the formal resolution of that conference: "That the study of history should constantly be associated with the study of topography and political geography, and should be supplemented by the study of historical and commercial geography and the drawing of historical maps." Good as this is, we may read between the lines even here the "theater of history" idea rather than the very ground and conditioning element of history. Thorpe, in an essay included in the volume on the Study of History in American Colleges, observes, "That study (history) should be at first chiefly geographical and sociological." He is speaking here of the public school. The College Entrance Examination Board might well go further in its syllabus of history than this: "Geographical knowledge will be tested by requiring the location of places and movements on an outline map." This might have been written a hundred years ago if history had then counted for admission to college.—*From Geography and History in the United States, A. P. Brigham, Report of the Eighth International Geographic Congress.*

THE INDUSTRIAL AND COMMERCIAL IMPORTANCE OF A TROPICAL POSSESSION.

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IT is the purpose of this paper to show how geographic conditions determine what shall be the economic relation between a temperate and a tropical country. All are more or less aware of the great climatic differences between temperate and inter-tropical lands, but few have made any extensive study of other existing geographic differences. A moment's meditation will make it clear that many of our luxuries and some of our necessities are from countries in very low latitudes; and that our industrial, social and economic organizations would each undergo serious alterations, were we obliged to return to the geographic limitations under which we of the mid-latitudes worked only four or five centuries ago. From the warm countries we now import rubber, coffee, fibers, gums, oils, drugs, dyes, starch, sugar, chocolate, cacao and fruits, early vegetables and ornamental woods; also ivory, skins of manatee, dugong, crocodile and monkey, to say nothing of the precious metals annually attracted to our mints and crucibles. Essentially all of these commodities require for their best development one or more of the following—high temperature, with no frost at any season, excessive rainfall and humidity, long ripening season, or are confined to warm seas—conditions which do not obtain outside of the tropics. We also value, perhaps too highly, tropical countries as markets for the ever increasing products of our shops and factories, because, with their lack of labor, skill, and capital almost nothing is made in these lands beyond the immediate requirements of local consumption.

There seem to be four fundamental motives for exploiting and acquiring new lands, (1) desire for luxuries, (2) demand for an increase in the amount or variety of the more substantial raw products, (3) the need of new lands for colonization by surplus population, (4) demand for markets.

Among people of the temperate regions the first motive is a prominent feature in most of their exploitation, especially in tropical countries. In modern times the second motive is usually active and exceedingly potent in the conquest of tropical possessions. The third has proved itself nearly valueless because of the difficulty, in a region very different climatically from the home locality, of effective acclimatization. The fourth motive is very strong in manufacturing countries, but, owing to the few wants of the natives, the value of tropical countries as markets is limited to certain classes of commodities, notably building and construction materials and adapted

machinery. To sum up then there are two distinct inducements for the development of tropical countries, (a) their new, cheaper or enlarged supplies of raw materials for our factories or directly for our tables, (b) their possibilities as markets for certain classes of our manufactured goods. It is to the geographic relations of these two propositions that I desire to turn the reader's attention. For illustration, one tropical region is presented, the French possessions in Further India. This country is one out of several which might well have been selected.

French Indo-China, according to the Statesman's Year Book, 1904, has an area of 250,000 square miles. This is contained in four dependencies, Cambodia, Cochin-China, Annam and Tonkin, with a total population of about 18,000,000, equivalent to 72 persons to every square mile whether it be dense forest, tangled jungle, pestilent marsh, fluctuating lake, rugged mountain or fertile plain,—all of which types of topography are fairly well represented in the country. For comparison, New York State with its area of 47,000 square miles and population of over 7,000,000, has 153 per square mile, approximately half of the total population being in Greater New York. There are no large cities in Indo-China. Two have each about 100,000 inhabitants and only two or three others exceed 20,000. In New York, 20 cities, besides the chief port, have each a population of over 20,000, and an average of over 60,000, leaving for the village and rural population 2,600,000 people. These figures indicate that the density of the rural and village population in French Indo-China is 30 per cent. higher than that of our great agricultural state. If the natives were as efficient as our American laborers, this would mean half as much labor possible per unit as in New York, or practically the same as that of the state outside of the metropolis. But primitive tools, wasteful methods, and a tropical climate so handicap the native that the potential efficiency is considerably less than ours, while the actual is still lower. However, despite all the handicaps, labor is going to waste in each of the dependencies.

Another element in the geographic conditions—climate, as just suggested, is thoroughly tropical as to excessive humidity and uniformity of high temperature. The mean annual temperature ranges from 70°-80° Fahr. throughout the lowlands, while on the mountains it decreases in proportion to the altitude; the mean annual rainfall ranges from 90 inches in the lowlands to 200 inches in the hills, with even higher local records. It is not a healthful climate, but possesses the general enervating effects of humid heat. Because of the decaying organic matter in the filthy, stagnant water, in the oozy, slimy mud of the deltas, and in the soil of the coastal lowlands, added to the miserable native sanitary conditions, there are in the lowlands several malignant diseases, often very destructive.

Fertile soils abound everywhere and may be made very productive, except in marshes or on rugged slopes. Forests, rich in valuable timber, usually predominate in the landscape; grass furnishes splendid pasture; the two great deltas are unsurpassed rice districts and the continuous warmth and copious rainfall make it possible annually to raise two or even three crops of some plants. At present rice is the chief crop and furnishes the staple food. Cotton, coffee, tobacco, indigo, cane-sugar and spices, together with a great variety of tropical fruits, are among the successfully cultivated plants. Cattle do well on the deforested hillsides, and quantities of fish swarm the rivers and shallow seas to the southeast.

Transportation facilities are inadequate. Most of the streams are used by the native dugouts, but owing to shifting sandbars will not float even small modern river craft, to say nothing of ocean vessels. No canals have been built. Only about a thousand miles of railroad exist in the country and there are no wagon roads save the Mandarin's road which parallels the eastern coast for a thousand miles. To transport rice fifty miles by human porterage or on donkeys, the two most common methods, along the narrow, forest-girt bridle paths, costs more than to carry it by ocean vessel from the oriental seaport to Marseilles.

Aside from auriferous gravels and quartz veins at Bong Mien, Annam, about 65 miles southeast of Turan, the chief port, the country is practically without the precious metals. Coal is known in two or three places, and by some is said to be abundant, while others deny its occurrence in valuable quantities. No iron is known, except some poor ores in the hills, a long distance from the coal. Several other metalliferous deposits have been reported but nothing is apparently known about them. Hence little reliance can be placed upon their exploitation and development for the first steps in the evolution of an industrial state.

Agriculture comes next; and upon the products of the soil the country must depend for its exports. Consul Covert, of Lyons, in a report some three years ago says: "Students of French colonies advise the extensive culture in Tonkin of tea, tobacco, coffee, silk, indigo, cotton, ramie, oilseeds and flax."

At present rice constitutes about 75 per cent. of the total annual exports, which in 1902 rose to $37,000,000. Other items on the export list are teak, sappan, lacquer, and other forest products, coffee, cattle and hides from the hills, tobacco, sugar, cotton, jute, pepper, copra and vanilla from the plantations, and fish, trepang and salt from the sea. In 1902 the imports amounted to about $43,000,000, including large items for railroad and other building materials and machinery, nearly all of which remain in the hands of Europeans and are used primarily to increase the exports.

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The above picture of the country and its resources discloses a fertile land under a tropical climate, with quantities of rich native crops, capable of becoming salable products if harvested and even crudely prepared; a land with unimproved rivers, no canals and no roads leading to the coast, save the sand-obstructed rivers and the bridle-paths for porters and pack donkeys, augmented by about 1000 miles of railroads; a country well populated with industrious but ignorant, backward people, insufficiently equipped and organized to get their products to market, and with a good government and administration, efficient so far as it goes, but powerless to prevent the frequent, destructive raids by the robber-bands from the hills, whose visits keep the interior valley people in constant terror and in a state of industrial indifference.

Earlier in the paper it was shown that in the modern conquest of new tropical countries one of two wants is seeking satisfaction, either a desire for raw materials or a desire for a market. In the light of the preceding paragraphs, which of her owner's wants can French Indo-China best supply? Here is a people who, while carrying on agriculture, never use any but the rudest tools and know no others; a people who navigate the streams and coast waters but need no boats besides a home-made dugout or a raft; have no roads, hence need no vehicles and no tools and machinery to make or repair either roads or wagons; have such fertile soil and favorable climatic conditions that fruit and vegetables are with little labor always ready for use; a region fairly densely populated; in such conditions of temperature that no wool and only a little cotton is worn, and no fuel, stoves, or complicated heating and ventilating contrivances are needed; a people whose culture requires no books, tapestry, costly fineries, delicate instruments or beautiful works of art, but which is satisfied with the showiest, tawdry gewgaws and ornaments in the French list of manufactures; in short, a native population that makes its necessities and desires practically nothing of value from abroad except civilization and industrial development until its tastes and habits are thereby changed. This change will require at least one generation.

European occupation and consequent development of a market, as in South Africa or in Victoria, Australia, is out of the question until colonists know the secret of acclimatization. The climate is unsuited to European laborers; malaria and other diseases lurk in the miasmic atmosphere and will continue to be the strongest opponent to colonization until good sanitary conditions, shelter and suitable food can be supplied to the strong, and in addition, proper medical aid to those who are suffering. Very much can be done to improve existing conditions and make life more tolerable for the im-

migrant, but in the present state of the country the element of the population from the temperate zone will consist of political, industrial and commercial masters. They are coming to control, not to colonize. Moreover the prolific gardens and loaded fruit trees will furnish food for them as well as for the natives, and the warmth of the climate reduces the amount of clothing and of heating appliances needed. Hence though the Europeans have more wants per capita than the natives, yet because of their insignificant numbers, their personal wants in the aggregate are very small.

If neither the natives nor the foreign population are sufficient to create a demand for foreign goods we may safely say that French Indo-China is not a good market for the textiles, shoes, furniture, vehicles, books, ornaments, foods, instruments and art work made by the industries of France. And it further appears that the surest way to make it a good market is to educate the natives through the years to know the uses of some of these goods. Of course moderate quantities of various commodities of French manufacture are needed in the East, but it is asserted that France furnishes only a small part of the imports even of such kinds as are used. England, Japan and the United States supply most of the textiles, general manufactures, kerosene and flour.

The other half of the question remains to be considered. We have seen that the chief agricultural product of the cultivated districts, the lowlands, is rice, and that this cereal furnishes three-fourths of the present exports. The grain is collected in little boats or by human porters and carried to the ports and thence shipped to Hong-Kong, thence to France and to some of the nearby eastern countries. France buys other rice because her rice-growing possessions do not furnish enough. It is also true that the Oriental market for this product is not yet overstocked. Hence an increase in the production may readily increase the export. Expansion of the output may be brought about in several ways; by better and cheaper methods of cultivation and consequent enlarged yield on the present fields, by the addition of new territory to the rice fields in the immediate vicinity or by the extension of its culture to new districts. The latter will involve the overcoming of distance to market by improved transportation facilities. Other crops of marked promise are sugar-cane and coffee, the former on the lowlands, the latter in the hill countries. For both commodities temperate region markets are good, and with proper encouragement, guidance and assistance in the way of mills, transportation facilities and organization of labor, the industries and output may both be greatly expanded. Cotton, indigo and jute are at home on the low hills and higher parts of the plains, while vanilla and tea have considerable possibilities on the

higher slopes. Pepper, oilseeds and silk have been successfully grown. A number of the above have native wild varieties of real value. Everything in this list but sugar is imported by France, some from Latin America and the United States, some from Egypt and India.

The immense forest crops, now ready to harvest, might be cut and shipped. Many of the woods are very valuable in the western markets, hence lumbering would be a remunerative industry. Forests should, by all means, be conserved by some adequate system of forestry. Several fiber plants other than cotton and jute are known and seem to find the geographic conditions congenial. Spices, always in demand, promise excellent returns.

As these opportunities are dwelt upon, two questions arise, viz., those of labor and of transportation. The former has been dealt with to some extent. It may be said in addition that the natives in different localities know something of the details of the cultivation and preparation for market of several of these plants. The labor supply is sufficient and only needs supervision to render it efficient. A few Europeans are testing it at present by developing plantations, and they say that they experience no trouble in getting all the reliable help desired. It takes patience and careful management but it is remunerative. When the utilization of native labor is once established, the labor question will become simpler with each succeeding generation. The natives learn the new agricultural processes and at the same time learn enough of western ways to prevent their earnings from accumulating to stifle the spirit of work engendered by their growing needs. The native trade at present is largely in the hands of Chinese merchants, a race of good traders.

But before this export of raw materials, made possible by the employment of native labor, attains appreciable dimensions, the transportation problem must be solved. Imported capital in the hands of Europeans, and native labor, must build roads, construct and operate railroads, dredge and equip the rivers and harbors for commercial navigation, build bridges, piers, lighthouses, warehouses and factories. French capital now so largely invested in Russia will do France more service invested here. There are geographic difficulties, however, in the way of all this building and especially in connection with the road and railroad construction which are unappreciated by men of the temperate regions. The climate, with its enervating influence and associated diseases, tells on the men who must be sent out to survey the routes and superintend the work. The excessive rains flood the streams, wash out bridges and destroy roadbeds. Woodwork is rotted by the great humidity and warmth, or riddled by termites, while a large force of section men is necessary to keep the rank vegeta-

tion from taking possession of the whole roadway. Then the distance to iron factories and the difficulty of getting heavy freight into the interior add other items to the expense of both building and maintaining a railroad. Construction must begin at the water's edge and stretch inland, thereby always keeping the growing end in vital and active communication with the coast and with sources of materials. It is by the construction of roads, railroads, bridges, sawmills and other mills for elementary preparation of the products that imports are to be increased, and French iron factories given an enlarged output. As far as limited experience can demonstrate the judicious investment of capital in these enterprises encourages agriculture, grazing, forestry, lumbering and commerce, and entices the native products out of the country to points where they can be sold for enough to pay the interest on the capital, and to buy more goods from the native cultivators and the organized foreign planters and ranchmen.

This tropical country is a type to which belong Tropical Africa, the Philippines and the Dutch East Indies except Java. In the former labor is less efficient, but in the Philippines it is superior to that found in Indo-China. Java is now so successfully farmed out by the Dutch colonial system that its people possess a much larger degree of efficiency than those of French Indo-China. In fact they are where the latter may be in two or three generations by judicious co-operation and management. The West Indies and Mexico are now in a higher stage of industrial development, making and demanding many commodities not yet needed in Indo-China, because their native populations were largely destroyed or fused with the aliens, so that they are dominated by a mixed race. For this reason they belong to another type. India differs from French Indo-China in having abundant good labor and a high state of civilization upon which England has engrafted such a vigorous, modern, social and economic development that there is a real demand for many classes of manufactures in which the Indo-Chinese could not possibly be interested.

But in countries of the Indo-China type the geographic conditions and limitations are such that unless the working of mineral wealth opens them to industrial and commercial activity, they must be opened and developed through the products of the soil, forests, fruits, fibers, grains, drugs, spices, or cattle, and this by labor native to the tropics, under the control and direction of extra-tropical intelligence. Thus the tropical country as here illustrated furnishes raw materials to the temperate one and uses certain classes of manufactures from the latter. Each is dependent upon the other for certain elements of its own prosperity which it itself cannot produce.

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AMERICAN SAMOA

BY VERNON L. KELLOGG
Professor in Stanford University, California

SAMOA is to some people a political problem; to some a place made memorable by the four years' abiding there of Robert Louis Stevenson; and to a few others a group of tropical islands whose geography and natural history need exploring. To most of us it is simply a map name—a geographical fairyland, without remembered capital, principal town or chief exports. But Samoa does have a capital—at least, in a small thatched hut, under the palms of Mulinuu village, a two-thirds naked king sits on a cocoanut-leaf mat and switches flies from his bare shoulders with a fly-flapper. And it has a principal city named Apia, memorable as the place where an impatient hurricane blew its breath on a certain Gordian knot of world politics and made ropy spindrift of it. And lastly it has chief exports, the name of which is that magic word of South Sea tales, copra. Volcanoes make the mountains and gorges and solid land of Samoa; two hundred inches of rain a year and an ardent tropic sun make its wonderful forest and bush and graceful palms; the "coral insect" makes its white shore-line and cruel reefs; while copra makes its enduring smell and is responsible for its civilization. About it all is the abiding presence of the ocean. From every vantage point one sees the blue water meet the blue sky. Ever in one's ears is the low growl of the water beaten back by the guarding reef. In every direction is it ocean-wide away to the world!

To the geographer the Samoan Islands must be studied from two points of view. First from that of the physio-geographer, and second from that of the politico-geographer. To get to the islands to study them it is simply necessary to embark on a Sydney liner (Oceanic S. S. Co.) at San Francisco. and sit tight for two weeks. You can get off at [1]Pago-pago, the port of Tutuila, one of the American islands, and the only harbor of any real consequence in the whole group. When you have reached Pago-pago, indeed when you are a few hours out of it, you have learned something of the physical geography of Samoa and for that matter, of many other Pacific islands. And this is, that not every South Sea island is a low reef or atoll of coral shining white in the sun with a scattering covering of pandanas and cocoanut palms, the whole thing lifting up but a few yards above the tropic blue ocean. Tutuila rises some twenty-five hundred feet, while certain other similarly formed Pacific islets are much higher. All these are simply volcanoes, now mostly dead (one broke out afresh in Samoa a few weeks ago),

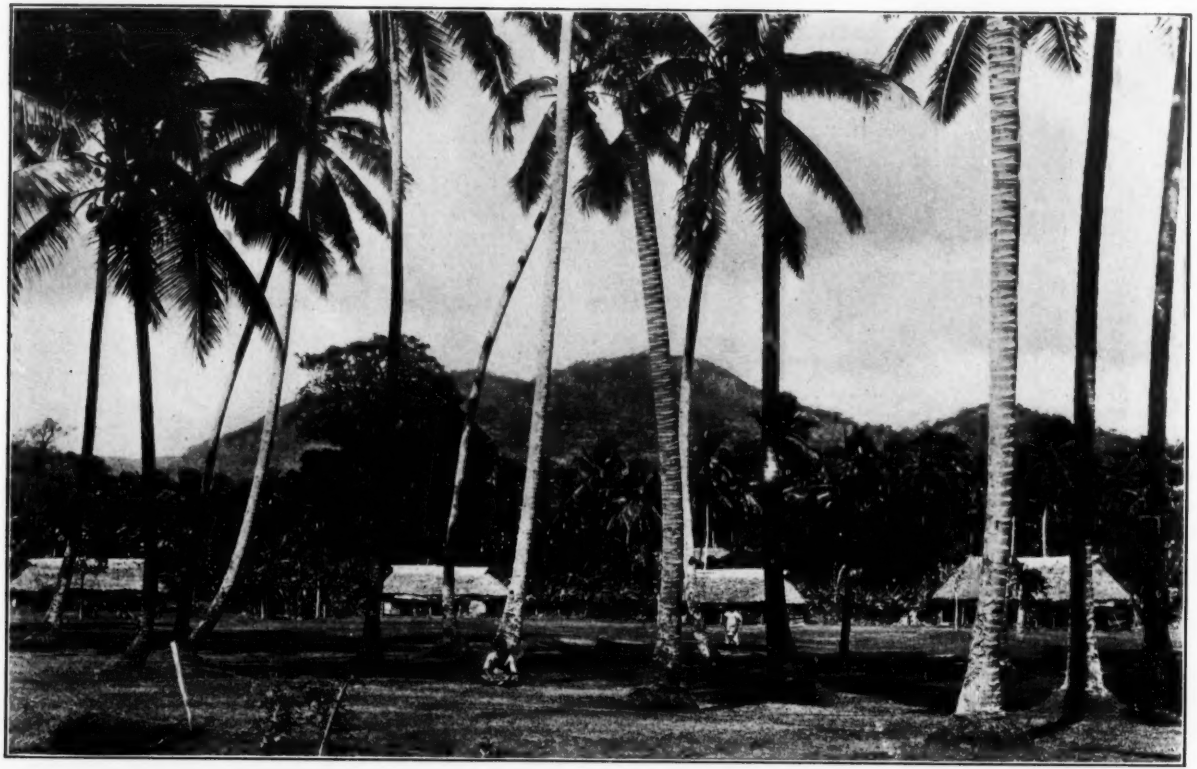
[1]In pronouncing Samoan names, wherever *g* is written pronounce it as *ng* in our word *sing*.

with their steep lava flanks covered with a marvel of beautiful tropic "bush." Around each of these old volcanoes, where it rises from the water, the busy coral polyps have built a reef which is fringing, if no subsidence of the island mass has occurred since its uplift, or barrier if there has. This reef is broken where the fresh water streams pour into the sea, for the coral dies in the face of a stream, and the one or even two hundreds of annual inches of

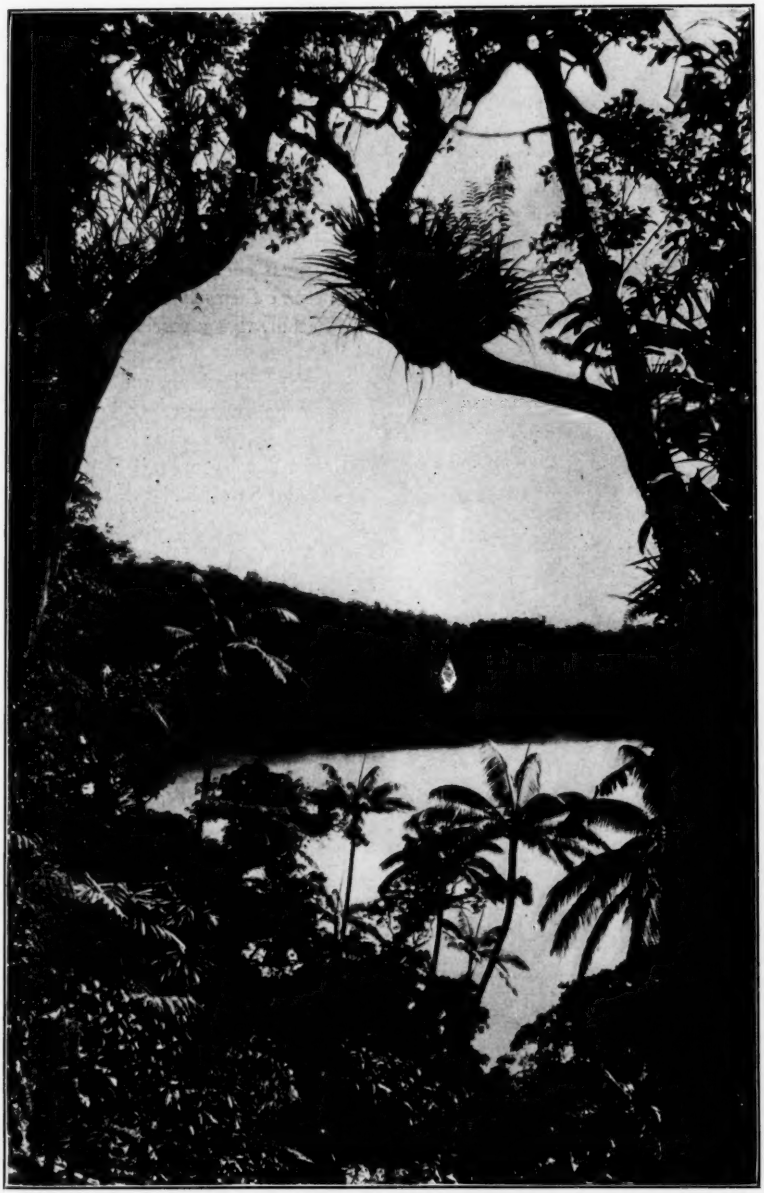
The Cocoanut Palms along the Ocean Shore.

water that fall on the steep sides of the island make streams that plunge with strong currents into the quiet sea water. Where the encircling reef meets the steady, trade-wind driven, long swells of the ocean, there is ever a mighty commotion; the roar of the surge and the white line of foam is an ever-present part of the islanders' world of sound and sight.

There are four principal islands in the Samoan group, besides six islets. These first belonged to the Samoans, then to Great Britain, Germany and the United States in common, and now are divided between Germany and us, England having received a *quid pro quo* elsewhere for her interest in Samoa. The largest island lies to the west, the others, progressively smaller and, geologically, progressively older, to the eastward. The first is Savaii, forty-five miles long and thirty miles wide, its primitive creating volcanoes



A Samoan Village under the Cocoanut Palms.



Lake Larruto, in the summit crater of an extinct volcano. (Note the dense tropical vegetation.)

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not yet cold, but with their rugged sides already overrun with liana-bound forests, as yet impassable to man. Next comes Upolu, forty miles by fifteen, richest in cocoanuts and in arable land, with its town Apia, the principal one in the islands, and its green mountain Vaea, with the glossy farm of Vailima on its flanks, securely within the Valhalla of literary fame. Apia harbor, calm and safe in ordinary days when the trades blow across the land, changes into a narrow gorge with jagged jaws of coral in the season of the northwest hurricanes. Then great ships are helpless in its tortuous channels, and the sheltering reefs become themselves the sources of the direst danger. It was in 1889, in this harbor, that a terrible hurricane sank the war ships of Germany and America.

Fifty miles beyond Upolu lies Tutuila, twenty miles long, and from two to five miles wide. Sixty miles still farther to the southeast, out in the sea, is Manua, almost circular, ten miles in diameter, and oldest of all the Samoan Islands in geological time, and once most honored in hereditary leadership. Tutuila and Manua are our islands; Savaii and Upolu belong to Germany.

Tutuila is primarily a huge volcanic crater, which has built up the island with the lava it has ejected. This crater of Pago-pago is fringed about with steep walls from 1,000 to 2,500 feet high, almost vertical on the inner edge after the fashion of craters, sloping away on the outside as the lava flows, two points in its rim, the mountains of Matafao and Peoa, much higher than the rest, and with a break half a mile wide on the south, letting in the sea. The harbor of Pago-pago, thus formed within the crater of Peoa, is nearly two miles deep and a mile wide. This size is, however, much reduced by the fringing reef which occupies half the strait at the entrance, and which forms an unbroken rim about the shore within. But with all this, there is room enough, if not for all the navies of the world, for all the ships likely ever to put in to Samoa. The winding entrance shuts out all surf from the south, and the great walls on every other side make the harbor securely landlocked, whatever the hurricane without. It is, in brief, the one good harbor in all the South Seas, and for that reason it is of high value to a great nation with expansive commercial aspirations. In any case, it is now ours, and is likely to remain so, a mere dock and coaling station in the eyes of our American administrators, but to its people, the colony of Tutuila of the United States of America, a position in their eyes far nobler than to be an independent kingdom.

Of arable land Tutuila has practically none: a few wet places are planted to taro, that curious aroid or tropical jack-in-the-pulpit, whose tuber is the substitute for the potato throughout the Pacific Islands, and for all

The Samoan "Bush." Luxuriant tropic vegetation making the inland forests impassable except where trails have been hewn through.

modern predigested foods, which find their prototype in *poi.* Along the seashore and on the lower flanks of the mountains is the cocoanut palm, the most graceful tree that grows. The cocoanut furnishes the only article of export from the island, and is, besides, the chief provider of the native's food, drink, clothes, house and house furnishings. The cocoanut product for export bears the name of copra. This is simply the meat of ripe cocoanuts cut out in little strips, and dried in the sun. The oily, shriveled bits are packed into sacks, and sold to the traders who ship them to Hamburg, to San Francisco, or to Sydney. From this copra is expressed the familiar cocoanut or palm oil used in making certain soaps. All the copra from all of Samoa—and by far the major part of it comes from the German island Upolu—amounts to barely half a million dollars' worth a year. And beyond copra the Samoan exports consist chiefly in much hopeful talk about some future cacao (chocolate). Besides cocoanuts, the banana, bread-fruit, papaya, mango, and a few other food trees grow freely, although but little attention is paid to their cultivation. Without effort on the part of any one, there is fruit enough for all. Add to this fruit, fish, chickens, pigs, *beche de mer,* and squid, and the island contributions to the Samoan's bill of fare are practically all named. As *bonnes bouches* fat larvæ of giant wood-boring beetles, or the uncooked insides of fresh sea-urchins, may be added. Once a year, too, in the full moon of November the strange sea-worm Palolo rises from the depths to spawn, and to furnish the natives with their daintiest tidbit. An acquired taste for canned salmon—familiarly known as *pea soupa,*—the principal American export to this interesting colony of ours—is much in evidence among all Samoans. My farewell gift to royalty consisted of a great tin of ship's biscuit, and a case of Columbia River salmon, and it distinctly had the royal approval.

When your San Francisco-Sydney liner steams slowly into the mouth of Pago-pago harbor, you realize that you have exchanged oak trees for cocoanut palms, prunes for bananas, and tailored men and women for scantily girdled children of nature. Still, the first child of nature I met on Pago beach was smoking a fat cigar and carrying a lantern and a disreputable umbrella. But his clothing was a lava-lava of tapa (mulberry-bark cloth), and his skin was brown and shone with cocoanut oil. He was a Samoan in the process of making over into an American. He wanted to sell me a war club which he had whittled out since seeing the steamer's smoke, and he could say "damn."

Away from the beach, though (and "beach" means only that part of the shore line of a South-Pacific island invaded by whites), the Samoan native is a glorious specimen of kindly, honest, care-free, wholesome, child-witted,

primitive man. Almost uniformly superbly developed physically, holding up straight and free six feet of stature, and looking from clear eyes out of open, intelligent faces, the Samoan men are among the finest of the anthropologists' living specimens. Never confound the tall, brown, straight-haired Polynesians of the Marquesas, Society and Samoan Islands with the under-sized, wooly-haired, black "boys" of most of the hundreds of South Sea islands in Micro- and Melanesia. They are races apart. The Samoan women have the same attractive race-characteristics, but their physical development is not so uniformly good as in the men; the anthropologist, if collecting "methodically at random," will capture more undesirable specimens in the gentler sex.

The missionaries have mostly conquered the South Seas. In each little village of toadstool huts, the biggest mushroom of all is "mijinery house" —South Pacific for church. And Sunday is a day, the South Pacific over, devoted to earnest howlings of adapted gospel hymns by fantastically clothed barbarians. A Samoan attends from four to seven services each Sunday, beginning at seven o'clock in the morning. He comes dressed in a white lava-lava, white duck jacket, fly-flapper, and serious countenance; she comes in a gaudy Mother-Hubbard, gaudier little green ribboned, blue-feather chip hat, and white-toothed smile. Each carries a cocoanut-leaf mat to sit on and hymn book to sing from. All can read, and all can sing. It is mostly singing, though a vociferously spoken sermon by the native preacher finds its appropriate place. And the singing is tuneful for the most part, and oh, so heartily enjoyed! Any South Sea islander will praise God (perhaps any god) willingly if he may sing his praises. And the missionaries have wisely found this line of least resistance.

The missionary and the results of his labors are the subject of constant debate the world over. In the South Pacific the missionaries have wrested the natives from the hands of adventurers and beach-combers, speaking by and large. But they have delivered the natives into the hands of an awful enemy of tropic people, called Clothes. From Monday to Saturday he and she have gone healthfully, naturally and without self-consciousness mostly undressed. The swift showers have beat on their oiled naked shoulders and limbs as harmlessly as on the duck's preened plumage. The perspiration induced by the tropic sun has swiftly and coolingly evaporated as fast as it oozed out. But on Sunday the cheap cotton clothing is put on to make him and her self-conscious and immodest, and to lie soaked with rain, or between showers with perspiration, in sticky folds over the body. Result, morally disastrous self-consciousness, and physically disastrous pneumonia. Truly it is a question whether clothes do not carry the natives as swiftly and

certainly into the presence of their new-found God, as does the awful heritage of loathsome disease bequeathed them by the dissolute whalers and beach-combers of pre-missionary days.

What in the name of sane things have indecent Mother-Hubbards and appalling green-ribboned chip hats to do in the great work of leading tropical heathendom to Christianity?

There is no encouragement for white settlers in American Samoa. In fact there is no particular place for them to settle, nor anything to do after settling. There is no land for agricultural purposes, beyond the little necessary for the raising of taro for the natives to eat, and the dense forests of the mountain side have little value as timber. Over on Upolu, the principal German island, there is some flat or flattish land available for cocoanut culture. The German colonists have tried to introduce the growing of cacao but nothing worth while has yet come from this attempt. On the whole Samoa is a country whose chief interest for us must be its physiography, its marvelous beauty, and its memories as the abiding and burial place of the much-loved Robert Louis Stevenson.

THE WORLD'S HIGHEST DAM

In a narrow ravine on the south fork of South Platte River, forty-eight miles from Denver, Col., there has been completed the Cheesman dam, the highest in the world. Its solid wall of masonry is 221 feet high, and impounds 30,000,000,000 gallons of water the depth of which would cover the sixteen stories of the Home Life Insurance Building on Broadway, New York, leaving only the spire above the surface. It was built by a private corporation and cost only $3,000,000,—a very modest sum for such a great engineering enterprise.

It almost seems as though Nature itself had intended the site of Cheesman dam to some day be utilized as a great reservoir. The cañon of the South Platte river at this point is not more than thirty-five feet wide at the bottom, and the sides are almost vertical for nearly 100 feet. At this point the cañon begins to widen, so that 200 feet above the bottom it is 600 feet wide, and 220 feet above the bottom its width is about 700 feet. From the bottom of the cañon to the summit of the dam the side walls are of solid granite. Before the masonry was laid, the loose boulders, rocks and the vast accumulation of débris were removed.

The width of this great dam on top is eighteen feet, with a 14-foot roadway. At the bottom it is 176 feet wide. The elevation of the top of the parapet walls above the sea is 6,865 feet.—*The Search Light.*

EDITORIAL

LABORATORY WORK IN SECONDARY SCHOOL GEOGRAPHY

THE necessity of laboratory work as an essential part of physical geography in secondary schools has long been recognized and for several years such work has been strongly developed in many schools.

Yet it would seem that thus far there is no consensus of opinion as to what good and efficient laboratory work is and little endeavor among teachers to follow more than the letter of the law in reference to the inclusion of laboratory work. Teachers seem not to realize that the requirement of at least forty exercises as a part of an approved course of study means forty exercises in geography and not some other subject, and that the assumption is that the forty exercises shall not be merely busy work but work of value to the pupil in making his work strong. It ought not to be a strain of the imagination to see further that the exercises should not be largely in one phase of the subject, but that they should be divided so as to show that the pupils have studied all phases of physical geography from the laboratory side.

There is a general agreement among the leaders, as is clearly shown by an analysis of the best modern text-books, that secondary physical geography should consist of four parts—the elements of mathematical geography, of the atmosphere, the lands and the ocean, with the larger part of the time, approximately one-half, devoted to the lands, because the land is the home of man.

So far as one can judge from the laboratory books submitted to the examiners of the College Entrance Examination Board, laboratory work and text-book work do not go hand in hand, and are not treated as complementary.

Almost anything that will keep pupils occupied for a double class period is submitted as legitimate laboratory work, and the larger proportion of the laboratory books contain a greater number of exercises on mathematical geography—many of them forcibly introduced and unrelated to the text-book material—than on any other phase of the subject. Summaries of text-book lessons, copies of weather maps drawn by the teacher on the blackboard, drawings of the layers in a sand bank, that do not illustrate any point, and many other exercises equally barren of any possible thought work on the part of the pupil, are presented as laboratory work. Several ways of finding the north-south line are presented as equal parts of the necessary forty counts

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to be credited for laboratory work. Simple laboratory exercises in pure physics and problems in astronomy, having no possible relation to text-book or class work, are submitted as physical geography, evidently with the thought that anything can be considered geography because geography makes use of the elements of the other sciences.

The one phase of the subject that is most neglected is the lands, in spite of the cheap and easily obtained United States Topographic Maps, which may be used most efficiently as the basis for laboratory problems by any unfossilized teacher. The several excellent laboratory manuals and most of the better modern text-books give lists of the maps that can be used to the best advantage. Yet they are not used as they ought to be.

It is time that an effort be made to have the secondary schools of the country do good laboratory work in physical geography and not merely work that may be done in a laboratory.

State Examination Boards and College entrance requirements should be more explicit as to laboratory work and should establish a certain minimum of exercises in each division of the subject which will be accepted in making up the necessary forty counts. Such detailed and explicit requirements will help to make the laboratory work definite and valuable, will relieve teachers of their present uncertainty as to what is expected and will show clearly that laboratory work is expected to be a strong part of the school study of the subject—not done as a time killer but because it is essential for clearness and to keep physical geography from merely being a study of words and sentences.

The good beginning in laboratory work, which is so strong and vital a part of the course in our best secondary schools, shows what can be done and what is worth while. Schools which are still wandering aimlessly need to be helped not only that their work may be stronger but that they may get the best results from the study of the most excellent texts which have so thoroughly replaced the old memoriter texts of a little more than a decade ago.

SUMMER COURSES IN GEOGRAPHY

The EDITOR will be glad to receive announcements of summer session courses in geography for 1906 in order that a complete list may be published in the annual statement of such opportunities in the May number. The MSS. should be in hand not later than April 10.

REVIEW

COMMERCIAL GEOGRAPHY.—Gannett, Garrison and Houston, pp. vi+415+30, 1905. American Book Co., New York.

THE advent of such works as the one noted above marks progress in the growth of the conception of commercial geography in American educational circles, and their use augurs exceedingly well for the business and commercial equipment of the coming generation of merchants, *entrepreneurs*, and commercial agents. The threefold authorship of the book bespeaks for it a breadth of thought and scope of treatment which perhaps no one mind could produce. The authors recognize that man's intelligent co-operation with, and the wise uses of, his physical surroundings are very important for permanent advancement in industry, commerce, and civilization; and to that end they endeavor to show the operating physiographic, and climatic influences on industry and production.

The book consists of 410 pages, exclusive of tables and index, 87 of which are devoted to a discussion of the commercial conditions, about 75 to commercial products and 250 to the products and commerce of the several countries. While the first section, "Commercial Conditions" is a fuller treatment than is customary in American texts and proportionately equivalent to that in the last edition of the standard English text, it is not yet made a sufficiently important part for a text in Commercial Geography. The second section, "Commercial Products" with their essential geographic and physiographic relations, is not so adequately treated as is the same subject in English and German books but is superior to any other American text. This section too might well be greatly expanded. In both sections, however, we have without doubt the fullest American treatment.

The third section, "Commercial Countries," begins with the United States and runs through the list of countries. Grouping several individual countries on a physiographic basis is frequently nicely done, as in the case of the Balkan states. This method reduces the political unit, and advantageously exalts the geographic and physiographic.

Among other admirable features are, (a) much description of processes used in the preparation and manufacture of raw products. (b) Specific classifications and systematization, in many categories, as under, "modifiers of temperature," "industries," "sites for cities," "soils," "harbors," etc. (c) Descriptions of great canals of the world, and a statement of their commercial and physiographic relations. (d) Discussions of variations in comparable processes in various lands or at various dates in the same lands, as for example under the heading "transportation."

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The customary lengthy tables of exports, imports, to whom, from whom, and percentages of special articles, are greatly reduced and combined at the end into five pages of valuable statistics. Diagrams and percentage values are scattered freely through the text, but actual amounts, so subject to fluctuations from year to year, are almost entirely omitted. Many illustrations and maps add to the readableness of the book. It ought to find wide usage in the High and Business School courses in Commercial Geography, and should prove a good reference work for grade geography.

G. D. H.

THE DEVELOPMENT OF TRANSPORTATION

The development of the systems of transportation which now place the producer in the interior of one continent in direct communication with the consumer in the interior of another continent is a product of a comparatively few years. Within the lifetime of men and women now living the world had not a single mile of railway or a single steamship crossing the ocean. To-day the world has on land 550,000 miles of railway, and on the ocean 6 million net tons of sail-carrying power and 18 million net tons of steam-carrying power. At the beginning of the last century the sail-carrying power aggregated 4 million tons; steam-carrying power on the ocean did not exist, nor did railways on land exist. By the middle of the century sail-carrying power on the ocean was more than 11 million tons, the steam-carrying power on the ocean was less than 1 million tons, and the railways on land were but 24,000 miles. By 1880 sail power on the ocean had reached 14½ million tons, steam power about 6 million tons, and railways on land 225,000 miles. From that time forward steam power on the ocean so rapidly took the place of the sail that in 1905 sailing vessels on the ocean aggregate but 6 million tons carrying power, while steam vessels have an aggregate tonnage of 18½ million tons and railways an aggregate of 550,000 miles in length, of which 217,000 miles, or two-fifths of the total, are in the United States. The wonderful effect on commerce of this increase of transportation power on land and ocean is shown in the fact that the international commerce of the world has grown from about 1,480 million dollars in 1800 to approximately 22 billions in 1905. Thus, under the newly created transportation systems of the last century, the international commerce of the world is to-day about fifteen times as much as at the beginning of last century, while the world's population is but two and one-half times as much as at that time, the commerce of the world's population, as a whole, having grown to nearly $14 per capita at the present time.—*Monthly Summary Commerce and Finance, November,* 1905.

RECENT PUBLICATIONS

REPORT OF ISTHMIAN CANAL COMMISSION 1899-1901. Quarto Edition, pp. 688. With 86 plates and maps. Washington, Government Printing Office, 1904.

Contains a long and valuable paper by Professor Emory R. Johnson, on the industrial and commercial value of canal, of special service to teachers of commercial geography. The volume of plates is mostly made up of maps and sections devoted to the region of the canals. The maps showing climatic and physical features of Central America and those showing resources and industries of different countries of the world as related to the canal are of great value to the specialist in commercial geography.

THE JUNIOR GEOGRAPHY. By A. J. Herbertson, being Volume II of The Oxford Geographies; pp. 288. The Clarendon Press, Oxford, 1905.

Devoted to a summary of the Regional Geography of the world, with the largest emphasis on Europe. Logical, causal, clear and effective. Illustrated by 166 diagrammatic maps. Of extreme value for teachers' reference use, especially for teachers dealing with the eastern continents. Deserves wide usage for reference work in America.

A HOME GEOGRAPHY OF NEW YORK CITY. By Gustav Straubenmüller; pp. xvi+230. Ginn & Company, Boston and New York, 1905.

Primarily for use in the lower grades of New York City. Deals with local geography and local history of New York City. Illustrated by excellent series of photographs including many of New York City of long ago. Interesting, graphic and full of information. The best book on the subject for children which has thus far appeared.

LEITFADEN FUR DEN UNTERRICHT IN DER GEOGRAPHIE. By H. A. Daniels; pp. viii+264. Halle, 1905.

A brief and condensed manual of geography, including mathematical, physical, political and regional geography. Good volume for reference for facts.

ARTICLES IN THE CURRENT GEOGRAPHICAL MAGAZINES

The Parsees and the Towers of Silence at Bombay, India, by Consul General W. T. Fee. *National Geographic Magazine,* December, 1905.

A splendidly illustrated account of the religious history, personal characteristics, manners and customs and social development of the Parsees. Most interesting description of this little known religious sect who have retained their individuality for more than a thousand years, though living amid the Hindoos.

Early Western Explorers and the Railroads. *Bulletin of the American Geographical Society,* December, 1905.

A brief account of the way in which the transcontinental railroads follow, in general, the routes originally followed by the explorers of the region.

The Partition of Sakhalin, *Bulletin of the American Geographical Society,* December, 1905.

A brief account with map of the island of Sakhalin, recently divided between the Japanese and Russians.

NOTES

THE NORTHWEST PASSAGE AT LAST ACCOMPLISHED.—Of the three great geographical problems reserved for our contemporary explorers in the Northern Hemisphere, one, the discovery of the Northeast Passage around the Russian and Siberian coast from the Atlantic to the Pacific, was solved not many years ago by Nordenskiold, of Sweden. It now appears that to a Scandinavian must be credited a second memorable achievement, the accomplishment of the Northwest Passage, known to exist, but never previously traversed in its entirety by the same navigator, from Baffin Bay to Bering Strait. We say accomplishment, because although Captain Amundsen has left his sloop, the Gjoa, for the winter at King Point on Mackenzie Bay, the rest of the voyage to Bering Strait is no difficult feat, being performed annually by whalers.

It will be remembered that scarcely had the land found by Columbus been generally recognized as forming no part of Asia, but as an independent continent, when attempts were begun to reach Cathay and the East Indies by rounding the vast unexpected obstacle on the south or on the north. The circuitous Southwest Passage was presently found by Magellan, but his success only stimulated other explorers, and especially those of Northern Europe, to search for a northwestern route to Asia, which, obviously, if it existed, would be incomparably shorter. Some three hundred and fifty years, however, were to elapse before the existence of such a route was believed by geographers to have been demonstrated, and the actual performance of the voyage by one and the same vessel from the Atlantic to the Pacific around the Arctic coast of North America was left for the twentieth century.

For three generations after Columbus the efforts to circumnavigate the northern edge of the American continent proved fruitless, except for the light they cast on the configuration of the Atlantic shore. In 1585, however, an important step in the right direction was made by John Davis, who penetrated the strait which bears his name; and about thirty years later another English sailor, William Baffin, after traversing the bay named after him, reached the long unequalled latitude of 77 degrees 45 minutes north. Not until 1818, however, was Lancaster Sound discovered, after which, in the course of a quarter of a century, several westward pointing channels were traced through the Arctic archipelago, until at last Banks Land, Prince Albert Land and Victoria Land were discovered on the western side of Melville Sound. Ultimately the existence of a northwest passage to Asia was proved by the fact that certain points were identified by explorers com-

ing from the west as having been previously reached by visitors from the east, although, as we have said, the whole voyage from Baffin Bay to Bering Strait has never yet been made by one and the same ship.

Although the Gjoa, to which is promised a share of the Vega's immortality, is only a small sloop of 46 tons, manned by eight sailors, her officers are qualified for the work of exploration by experience and scientific attainments. Captain Amundsen was first officer of the Belgica, employed in the Belgian attempt at south polar exploration, and he is accompanied by Lieutenant Gotfried Hansen, of the Danish Royal Navy. It is more than two and a half years since the Gjoa left Norway on June 1, 1903. The first stop of the little expedition was made at Godhaven, Greenland, and the first base station was established near the Island of North Somerset. At Leopold Harbor in 1904, the explorers made extensive magnetic observations, and in the spring of the present year they set up their self-registering instruments on King William Island, where, as we are justified in inferring from a telegram sent by Captain Amundsen to Fridtjof Nansen at Christiania, he definitely located the north magnetic pole, which in 1831 Captain J. C. Ross, relying on a single observation, had placed in the peninsula of Boothia. This was the capital scientific aim of the present expedition.

We add that, according to a private cable received at Seattle from the explorer, who, leaving his vessel to winter at King Point, had gone overland to Port Egbert, Alaska, Captain Amundsen found on King William Island a monument erected by the ill fated Sir John Franklin's expedition. It will be remembered that in 1878-80 Lieutenant Schwatka's expedition came upon the skeletons of some of Franklin's men and of one of his lieutenants. It may be reserved for the Norwegian explorer to find the remains of Franklin himself, and to place them at last beneath the cenotaph in Westminster Abbey which now bears the inscription:

> "Not here! The white North has thy bones; and thou,
> Heroic sailor soul,
> Art passing on thine happier voyage now
> Toward no earthly pole."
>
> ——*The New York Sun.*

NOTES ON AMUNDSEN'S ACHIEVEMENT.—The attempts to make the Northwest Passage have cost very dear in human life and in treasure. They involved the greatest of Arctic tragedies—the loss of the Franklin party of 129 souls. They resulted in the destruction by ice crushing of some of the stoutest ships that ever were built. But the Passage has at last been made, by a vessel large enough to accommodate only a few men with comfort and fitted with a petroleum engine! The Gjoa from the Atlantic has reached the

waters near the mouth of the Mackenzie River that are frequented every year by whalers from Bering Strait.

Last summer when Amundsen was about to start westward for Bering Strait he sent a messenger south to the Canadians in Hudson Bay telling them of his purpose to steam westward through the channels. Henry Hudson was hunting for this Northwest Passage when his crew put him adrift in Hudson Bay. He perished in the same waters over which the news was brought to us that the little Norwegian party was about to attempt the Passage.

From 1818 to 1855 the British sent out ten large expeditions with seventeen of their finest ships to make this Passage, if possible. They all failed to push the ships through, and it was not till after 1850 that the existence of continuous sea communications north of America was made known. In that year McClure, coming from the Pacific through Bering Strait, reached with his sledges the northeast extremity of Banks Land, which Parry, coming from the Atlantic, had visited in 1819. It was years later before we knew of Sir John Franklin's earlier discovery of a shorter route for the Northwest Passage.

When the records of the Franklin expedition were recovered it was found that in May, 1848, Lieut. Graham Gore, with seven men of the party, had explored the shores of King William Land. Soon after passing Point Victory they saw the continent of North America in the distance and realized that the long sought for Passage had at last been discovered. They had reached the point from which Simpson had traced the edge of the Arctic Ocean hundreds of miles west to Cape Barrow, and they might actually have accomplished the Northwest Passage themselves had they been able to force their ships through the short stretch of ice to the opening channels along the American coast.

Those Arctic heroes who starved to death were the first to discover the Northwest Passage; and the route indicated in their records is that which Amundsen has followed to success, for the Passage has been made by the route discovered by the Franklin party fifty-seven years ago.

Point Barrow was never reached by Cook or Beechey, but every season now even the sailing vessels among the whalers pass around it and far to the east. They travel in the channels opening between the heavy floe ice and the mainland, and this is the route that Franklin and Simpson discovered. Its practicability has now been demonstrated by one of the smallest vessels that ever entered the Arctic.—*The New York Sun.*

THE KINGDOM OF NORWAY.—By a vote of about four to one, the people of Norway have decided upon a kingdom instead of a republic as their

future form of government; and by a unanimous vote the Storthing has chosen Prince Charles of Denmark as King of Norway. He has accepted the position, and will adopt the name of Haakon VII. First united with Sweden, by the marriage of a Norwegian princess to a Swedish king, later in union with Denmark, and again with Sweden, it has been nearly seven hundred years since Norway has had a king of its own who was not also ruler of one of the other Scandinavian kingdoms. The union with Denmark, which lasted from 1397 to 1814, was more intimate than that with Sweden, which has just been dissolved by one of the most peaceful revolutions in history; but the Norwegians always considered themselves a separate people. Dr. Fridtjof Nansen, the famous Arctic explorer, comes as the first Norwegian minister to Great Britain; and a daughter of King Edward VII., as wife of Prince Carl, becomes Queen of Norway.

JAMESTOWN PAST AND PRESENT.—On landing at Jamestown Island we give ourselves up to the task of rebuilding and repeopling the little town which speaks so eloquently to every American citizen. Turning to the left, for there the tower beckons, we enter the church enclosure. Here are the foundation walls of three of the five Jamestown churches and we examine with reverent interest the inner line of bricks, which we are told supported the wooden walls of the third Colonial church, the one in which met the first General Assembly of Virginia. We picture the governor, the deputy governor, the council, and the twenty-two burgesses walking in dignified procession up the narrow aisle of the little church, as with stern, serious faces they proceed to transact their important business—a different scene indeed from the squalor and misery that filled the little village only nine years before when Lord de la Warre saved the colony. Was it here, we wonder, that Pocahontas was baptized and here that she was married? Alas! we learn that the little chapel which witnessed these scenes in the life of the Indian maiden who gave a touch of romance to the rude pioneer town, was inside the palisaded fort now buried under the restless waves of the James. It was just yonder, a stone's throw; while still further out in the water is hidden in the sand of the river bottom the spot on which the Jamestown settlers stepped from their ships. No Plymouth Rock this to withstand forever the action of the waves!

But let us turn again to the foundation walls and the pavements of the churches. Here are the tiles in the chancel of the wooden church and above them the two sets belonging to the two brick churches built on the same foundations. The tower was too massive to be destroyed when the town was fired in Bacon's Rebellion and still gives proof of its age in the "bonded" English brick of which it is made and in the loopholes near its top

which indicate that it was used for defense from the Indians before Opechancanough removed that danger by his death. The worshipers who were wont to gather in these two churches now rest in the ancient graveyard outside. Here lie Dr. James Blair, "Commissary of Virginia and sometime minister of this parish," and his wife, Sarah, a daughter of Colonel Benjamin Harrison. A young sycamore starting between their tombstones carried with it, in the strength of its young life, a portion of Mrs. Blair's tombstone to the height of ten feet. This was accidentally released in 1895 and the tree has nearly closed the cavity, growing meanwhile to an enormous height and shading the whole graveyard. How typical of the gigantic growth of the infant republic born here! All about the old graveyard lie ancient stones, many of them in fragments, and some with their inscriptions quite indecipherable; beyond the enclosure, on the bank of the river, have been found human skeletons lying in such positions as to indicate that the graveyard once extended to the James. We are told that the present lot is but about one-third the size of the original, and when we think of the thousands who perished at Jamestown in the early days we are not surprised that human remains have been found in nearly every part of the island.

Virginians have at length awakened to a realizing sense of the importance of preserving what remains of our first settlement. The ancient foundations of the town are being uncovered and every possible effort is being made to keep in good condition what is left of the sacred objects in the church enclosure. So far as possible the tombstones have been mended and the inscriptions made more legible, further vandalism being prevented by a caretaker who lives on the island.

Leaving the graveyard we walk thoughtfully past the earthworks of 1861, now grassgrown and forming part of a shady park peopled with mocking-birds and cardinals. Beyond, we come to the "third ridge" where recent excavations have laid bare the foundations of a row of houses, one of them being the State House in front of which Bacon drew up his soldiers and demanded his commission of Sir William Berkeley. The next one belonged to Colonel Philip Ludwell under whose direction the town was rebuilt after Bacon's Rebellion. As the excavations proceed it will be possible to picture the town as it looked during its last days.

It is now nearly three hundred years since the landing at Jamestown, and the anniversary is to be fitly celebrated by the proposed Jamestown Exposition. It is unfortunate that the site of the first settlement is so unsuitable a one for its ter-centennial that it must be held some distance away at Sewell's Point on Hampton Roads. But surely no American who attends the Exposition will be so unpatriotic as to fail to visit Jamestown Island, the scene of his nation's birth.—*The Southern Workman.*

TREE PLANTING BY RAILROADS.—The rapidly diminishing supply of timber for wooden cross-ties, as a substitute for which metal has so far failed, has led the managers of several great railroads to undertake the planting of trees to supply ties. The Pennsylvania is planting the yellow locust and certain western railroads the catalpa. During this year the Pennsylvania plans to extend its plantations to more than 100,000,000 trees; but these if fully grown would supply ties to this single railroad system for less than three years. It is said that in order to have a constant supply for the future this railroad must set more than a thousand acres with trees each year.—*The Nature Study Review.*

IMPORTATION OF SUGAR INTO THE UNITED STATES IN 1905.—The sugar brought into the United States in the year about to end will exceed 150 million dollars in value. More than 50 million dollars' worth of this comes from our own islands of Hawaii, Porto Rico, and the Philippine Islands, and more than 100 million dollars' worth from foreign countries. The total value of sugar brought into the country in the year 1905 will by far exceed that of any preceding year. In the ten months ending with October the total value of sugar brought into the country was 144 million dollars, and as the figures for the month of October alone exceed 8 million dollars it is quite apparent that the additions made in the months of November and December will carry it far past the 150 million dollar line. Never before the year 1890 had the value of sugar imported reached as much as 100 million dollars. In the fiscal year 1891 it was 105 millions, and slowly increased until in the fiscal year 1894 it was 127 millions. Then the total fell again below 100 millions, and so remained until the fiscal year 1900 when the total was again 100 millions, but in no year has it reached anything like the figure which the present calendar year promises as the total value of sugar brought into the country.

This remarkable record which the year 1905 will present of more than 150 million dollars' worth of sugar brought into the United States is due rather to increased prices than to an increase in quantity. The total quantity of sugar brought in from foreign countries, and from Hawaii and Porto Rico combined, is, in the ten months ending with October, 1905, 4,458,290,379 pounds, and in the ten months ending with October, 1904, was 4,643,808,298 pounds. Thus the actual quantity of sugar brought into the country in the year about to end will be something less than that of last year, while the valuation, which is based upon the selling price at the ports from which it is shipped to the United States, will be more than 40 million dollars in excess of the valuation of sugar brought in during last year.

ALASKA.—That agriculture can be successfully prosecuted has been clearly demonstrated, $5,237 worth of agricultural implements having been

shipped into Alaska during the last fiscal year. Wheat, barley, oats, potatoes, and hay have been harvested; strawberries, cauliflower, and other plants have been cultivated. There are four agricultural experiment stations in the district; one at Sitka, given largely to the cultivation of nursery plants and their distribution; one at Kenai, on Cooks Inlet, testing the native and imported grasses and dairy work, and one each at Copper Center and at Rampart, on the Yukon River, where grains are tested. Dairying promises to be one of the chief industries, owing to the enormous wealth of grasses in southwestern Alaska. Milch cows have long been kept at most of the coast settlements, and they do very well while feeding on the green grasses. Many admirable sites for dairying colonies or settlements may be had on Kodiak Island, or other islands, and on the mainland. The Finnish colony on the Kenai Peninsula will engage itself in this industry.

Although the mineral wealth of Alaska is at present its most attractive resource, the rich alluvial deposits of gold in distant parts attracting thousands of men hoping to secure fortunes quickly, the governor states that this industry is not in a satisfactory condition, owing to the failure of the Government to extend to it the same fostering care as to other industries in the district which are looked after by resident Government agents. He thinks that this can be remedied by the appointment of a resident mining commissioner.

Gold is being found in nearly every part of the district, and the advance in the several localities during the past year has been marked and gratifying. New discoveries and locations have been made in the country between Ketchikan and Juneau, the latest discovery being on the west side of Chichagof Island, about 60 miles north of Sitka. A considerable amount of gold has been taken at Cape Yakataga, about 65 miles east of Kayak. The whole area south of the Yukon and north of the sea seems to be gold producing, a great part being unexplored. The output of gold from the mines for the year has been about $10,000,000. Silver has been produced in considerable quantity from the galena ore in the Sheep Creek mines, near Juneau, and large galena deposits, rich in silver, have been discovered at the head of the Fish River, emptying into Golofnin Bay in Norton Sound. Copper is being extensively mined, a number of such properties being located upon Prince William Sound.

Alaska is also rich in coal, almost beyond calculation, its quality being put down by experts as the best on the Pacific Ocean. The Alaska Central Railway, running north from Seward, expects to tap important coal fields on the Matanuska River and deliver the coal at its bunkers at Seward. Hard coal is also found at Cape Lisburne on the Arctic on nearly the sixty-ninth

parallel. Petroleum, gypsum, and marble are also found in great quantities, and it is understood that contracts have been entered into for the delivery of large lots of marble on Puget Sound. The governor thinks that in time diamonds will be discovered, considering that volcanoes have been very active in the district in past ages.

The total pack of the salmon canneries for the past year will be about 1,500,000 cases of 4 dozen 1-pound cans to the case, but the prices have been rather low, as there has not been an active demand for these products. A number of canneries were not in operation. The governor thinks this condition is due to the lack of sanitary precautions, and that upon failure of the owners to agree among themselves upon rules and regulations for cleaning, handling, and packing this product the Government should promulgate rules for a rigid inspection and have an officer at each cannery to see that the same are strictly complied with.

Halibut and cod are very abundant and are being sent to the eastern markets; herring are caught in large quantities, and the oil and guano factories are using them for their work; after the oil is extracted they are turned into fertilizer. At Juneau the small herrings are being put up for sardines, and as the product seems to give entire satisfaction, the demand for them is increasing. The governor is of the opinion that the wealth of the sea along the Alaskan shores in time will bring to her inhabitants as much wealth as her hills and valleys yield in gold.

The exports of furs and fur skins is given at nearly $500,000, but as the finest grades can be placed in a small compass and handled as personal baggage, it is doubtful whether that amount covers the whole value.

The seal rookeries are becoming year by year smaller, and the killing by the North American Commercial Company's agents during the past year has been about 13,000 on St. Paul and 1,300 on St. George Island. The governor states that it would be good policy for the Government to come to a friendly understanding for the remainder of the lease with that company, based upon the number taken the last five years, stop the killing for eight or ten years, deport the natives on both islands, and keep there only the necessary agents to look after the rookeries. To prevent the entire extermination of these animals some such immediate action is necessary.—*From Report of Secretary of the Interior for year ending June* 30, 1905.

Relation of Geography to Nature-Study.—The *Nature-Study Review* for September, 1905, contains a long and interesting article on the Relation of Geography to Nature-Study with complete outline of course for eight grades. The following extract shows the point of view of the author

and suggests the plan on which his inclusive and suggestive course is outlined:

GEOGRAPHY AND NATURE-STUDY.—Geography, as we have seen, should begin with facts open to observation in the home district, and the pupils when thoroughly grounded in the meaning of the relations existing there are then prepared to extend their studies intelligently over the world.

One of the first principles of nature-study is that it shall deal with facts open to the personal experience of the pupils, and these are necessarily bound up with his home surroundings. Geography and nature-study then, in the earlier years of school life, deal from the same standpoint with practically the same materials. For the first three years, at least, we cannot differentiate them in practice. Possibly in the fourth year it may be best to do so, although even here both subjects continue to deal with the home, but from somewhat different standpoints.

There appears to be a deeply rooted tendency, in planning courses of study for the elementary school, to separate closely related facts in order to make them fit into our artificial systems. The child sees things as wholes and understands much better if related facts are presented in their natural associations.

Another mistake constantly made is to expect too much of young children in the way of forming ideas and mental images of what is outside of their experience. How can we expect them to comprehend world relations, or to make other than parrot-like responses before they understand the meaning of similar relations in the little world about them? The fifth year is certainly early enough to begin the formal study of the earth as a whole, although this is far from implying that all reference to the world as a whole be omitted up to this point. Through nature-myths, folk-tales, stories of children and life in other lands the pupils will imbibe incidentally general notions which will form a setting for the more advanced work when they are advanced sufficiently to take it up. Even after general geography has been begun the home must still continue to be the datum mark to which the pupils will constantly refer for comparison with what they are attempting to learn about similar relations elsewhere.

This undifferentiated work of the first four years, through which the pupils come to understand their surroundings, we may call either home geography or nature-study, preferably the latter, for it conveys a wider and more generalized meaning. It would be better still if we had a comprehensive term similar to the German "heimatskunde," or "home-lore" as it has been translated.

The criticism that geography is a mere jumble of facts from different

sciences and that to modernize the subject these should be segregated in primers, each dealing with a particular science, is wrong in theory and has been shown to be so in actual practice. Geography, as we have seen, has a definite content and a particular purpose to fulfil. If we separate its component parts we are destroying the subject and the higher outlook upon the phenomena of the earth which their synthesis affords us.

Marked differences in practice exist in different cities of the United States as to the time of beginning geography, although nature-study wherever taught is usually found in the first grade. In Chicago the two subjects are combined for the first three years. In Boston and New York nature-study begins in the first grade and geography in the fourth, while in the former city the study of natural phenomena from the fourth grade upward is termed "elementary science." In the Horace Mann School of Teachers College, New York, work under geography is begun in the third grade. The University Elementary School of Chicago closely correlates both geography and nature-study throughout the course. It is probable however that the differences in practice are not as great as they appear upon paper, for much that is really geography is often included under nature-study.

Beginning with the fifth year, geography has to do mainly with facts beyond the experience of the pupil, while nature-study is still largely confined to the home district. It is apparent that as a usual thing little attempt is made in arranging courses of study to correlate nature-study and geography. After the two have separated at the beginning of the grammar-school period it is evidently not possible to make a complete correlation because the fields covered are not the same, and yet, these studies are nearly related and should be made to harmonize and mutually support each other as far as possible. Such an arrangement would aid in giving a plan to the nature-study work, for the lack of system has been a partial cause of the frequent failures.

Such topics from the home district as the relation of the climatic conditions to the features of the land, to bodies of water, to the direction of the wind, etc.; the relation of plants and animals to their environment, the dependence of man upon the various physical conditions about him; are phases of nature-study from one point of view, while from another point of view they are clearly geographic.

The carrying out of experiments in evaporation, solution, and crystallization is nature-study, but when this is done in connection with the study of the great deserts of the world it aids in the acquirement of real geographic knowledge. The deposits of salt, soda, borax, and nitre are

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governed in their formation and distribution by the principles exemplified in the physical phenomena referred to. Numberless other examples could be given if it were necessary, to show how nature-study can support and elucidate the facts of geography.

If the infinite detail, too often present, could be omitted from all courses of nature-study, as well as all those topics which cannot appeal to the child mind, and the work be so shaped, particularly in the upper grades, as to throw light upon the geography the work in both subjects will be made more satisfactory.

Nature-study dealing with the phenomena of our environment; geography beginning with the same phenomena, but ultimately extending its scope to take in their world relations; and history, the development of man under various physical and sociological conditions should be considered as practically one subject in the earlier half of the elementary-school course, and as closely related subjects in the later half. Although we are still very far from being perfect in practice, yet one important step has been gained in the growing consciousness that the only way in which the child can gain any real benefit from his study of the facts of the phenomenal world is to deal with them in their natural settings.

With the differentiation of nature-study and geography at the beginning of the grammar-school period there are new problems to be solved. How shall the geography of distant regions be treated so as to produce the most distinct and permanent mental images? In the first place we must abandon the method of the present text-books, and cease skimming over the world in a formal and almost meaningless manner. We must, rather, take up the study of the world as a living organism whose parts and functions are mutually dependent.

The relief, climate, the plants and animals of the home district and man's relation to them must be made the starting point for the study of similar things in remote districts that the child has not visited, and must continue to form a constant source of inspiration for such study, as long as it lasts.

The attempt at memorizing the disconnected facts of geography has generally proved a failure. To avoid this waste of energy these facts must not only be presented in their causal relations, but also in such a manner as to arouse the attention and interest. History, stories of adventure and discovery, current events, and a familiarity with the natural phenomena of the home region all aid in vitalizing the facts of geography."

How to Begin Geography.—A subject can be so taught that pupils learn much and are worse off than if they had never learned it. Knowledge gained at the cost of hatred for a subject, or at the expense of further interest

in it, is of doubtful value, to say the least. It is a serious mistake to limit the outlook upon a subject to the work of any one grade, or so to present matter that "results" for the term can be measured by the facts learned in that line. That teachers need to know thoroughly the work of their particular grade no one will dispute; but that they need to have a good idea of the entire field is also indisputable. For a pupil to go through a half year or a year and have at the end of that time no educational product would be a pity; but that many go through one grade after another seeing only certain tasks to be mastered in each, and with no abiding interest in any subject as a whole, is also a pity. The broad outlook that takes in the subject as a whole is especially needed in beginning geography. Geography should be taught from beginning to end as a world-wide subject, and the work of the first five months is not to teach a certain portion but to prepare for the teaching—to arouse an interest in the subject and put the pupils in the way of satisfying that interest. It is the work of this grade to select the site and collect the material to be used later in building the superstructure. Here the foundation is laid, and it behooves us to dig deep into the child's experience, to search the hidden recesses of his imagination, that we may found upon the firm rock of intelligence the structure of knowledge we plan to rear. We should give him such a basis for his work that he may himself build thereon during all the years to come. By a get-geography-quick plan a map of some section is placed before the pupils and they are set to work bounding, locating and describing. This drudgery may provide some facts for glib recitation, but it will probably create a dislike for the subject and give a distorted notion of a map that no future teaching, however good, can entirely eradicate. Better far begin by using the geography that the children have learned outside of school—for they have learned much, though they have never dreamed of calling it geography—and lead up to map study in such a way that a map of any kind will thenceforth possess for them a world of meaning. The great aim in this first work should be to develop a conception of geography that will make future work rational and interesting—a conception that will forever avert the danger of a crooked-black-line notion of the Mississippi river, a pink Switzerland. The "results" to be looked for in this grade are an intense interest in geography and an ability to use maps and other material intelligently. Incidentally some "geography" will be taught, but that is not to be the aim. Be content in this grade to lay the foundation, leaving it to another to build thereon.

There is no need to-day to argue that this foundation work should begin with home geography; every student of method admits that. The question now is, what is home geography? How shall it be begun? Shall it be by

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making a diagram of the schoolroom and drawing various nearby sections to a scale? Children do not seem to be much at home in the geography begun in this way. Such work undoubtedly has its place, but not as an introduction to the study of geography. It is too mechanical and uninteresting; more than that, it puts the emphasis in the wrong place; a map should appeal to the imagination, and geography should enable one to picture things in the large; to begin by ruling off a room destroys geographical perspective; sets the class to using an inverted telescope, so to speak.

Or shall we begin home geography with a study of the soil of the locality? The great difficulty with this suggestion for schools in large cities is obvious, but even where the soil is not covered with paving stones, but is easily accessible—in country schools—is not this beginning geology rather than geography? Is it with the study of the soil, the river, the plain, as such, that geography is concerned, or is it the soil in connection with the beet sugar (or some other) industry, the river as water power, or a water-course, or a bit of scenery—as serving man's need or suiting his fancy—that claims the geographer's attention? If the former, then let us take a pan of dirt and build our earth and then people it; if the latter, then let us start with the people and their activities, catching a glimpse of the bigness of the life around us with its interrelations with a whole world, and then follow back into the sources of wealth and beauty; the one calls for the microscope, the other for the telescope; which is the geographical instrument per excellence? You may say, "What matters it whether the study of the soil come the first week or three months later, since by either plan the soil is to be studied at some stage?" The difference lies in the fact that the one gives a near-sighted view, the other a broad introduction. I want the child to discover what it is all about and to get a notion of the interdependence and mutual obligation of all life—of the greatness of the world—ere he settle down to study one detail, so that the detail shall not be petty. In treating of the earth in its relation to man it is not necessary to begin with the stranger Earth and back around to an awkward meeting with the old acquaintance Man. Man should be the starting point—no, not man, boy—the boy in his home with his cap and shoes, his bread and butter, his comforts and his duties. It is not far from the sidewalk shovel and the kitchen broom to the street cleaning department; from the parents providing for the home and directing its interests with the help of children and servants to the mayor (or the village president) with all of his assistants. It is only a step from the cereal on the breakfast table to the wheat fields of Kansas or of Austro-Hungary, but it is thousands of miles if you reverse the order. Begin with informal discussion of the home, with its people, their needs, how these needs are satisfied,

its government, etc.; then broaden the children's horizon by a discussion of other homes—homes of birds, squirrels, Eskimos, Indians. Then lead by talks—in all of this work get the children to do the most of the talking—to an appreciation of the time when there were no homes here but those of birds, wild animals, Indians; and develop an idea of the conditions that must have existed—no streets, of course, but paths made by animals, paths to neighbor's houses (these are the beginning of streets); no stores, each family obliged to raise its own provisions (then comes informal trading with each other, and later the first store); no churches; no schools. Then step by step build up the city you live in, mingling local history with geography, appealing constantly to the imagination and drawing all the time from the child's experience. Accompany all of this work with rough diagram on the blackboard; use pictures whenever they can be obtained; but use no map, no text-book, no globe, until later.—*School Century, December,* 1905.

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THE TROPICS.—All parts of the equatorial zone are not equally disagreeable or hostile so far as occupation by the white race is concerned. Many elderly persons and those who are overworked may find rest from nervous tension in the enervating climate of the tropics. The dryer districts are to be preferred to the moister, the higher altitudes to the lowlands, coasts and islands well ventilated by prevailing winds to regions where the air is stagnant. Much-needed relief from the heat at sea-level may be obtained by resort to tropical mountain stations, and many of these have become well-known health resorts. Tropical mountain climates resemble the climate of the temperate zones in their lower temperatures and in certain other ways, but they can never be the equivalent of a temperate zone climate, for they lack the seasonal changes. Some tropical climatic characteristics disappear with altitude while others change little. The non-seasonal character of tropical mountain climates, the so-called "perpetual spring," is not by any means the best fitted for man's physical and mental development, however pleasant it may be for a time. With increase of altitude, there is a decrease in or a disappearance of some of the diseases which prevail near sea level, such as malaria, yellow fever, liver abscess, etc. In their stead, however, may come an increasing frequency of diseases which are characteristic of high latitudes, such as rheumatism, and heart and lung troubles. Tropical hill stations in India show a smaller mortality among

the troops than do lower levels. In India, as elsewhere in the tropics, hill stations are beneficial in restoring those who are exhausted by overwork or by the heat of the lowlands. They are especially advantageous for delicate women and children. Nevertheless, climates which are temperate because of altitude in the tropics cannot replace climates which are "temperate" because of latitude.

The acclimatization of the white race in the tropics is a question of vast importance. Upon it depends the control, government and utilization of the tropics. It is a very complex problem, and it has been much discussed. It is complicated by the controls exercised by race, diet, occupations, habits of life and the like. To discuss it fully is impossible at this time. The gist of the matter is this: White residents from cooler latitudes on coming into the tropics must adjust themselves physiologically to the new climatic conditions. During this adjustment there is more or less strain on various organs of the body. The strain may be too severe; then the individual suffers. The adjustment is usually much retarded and hindered by a persistence in habits of food, drink and general mode of life which, however well suited to the home climate, do not fit tropical conditions. During the adjustment, especially if complicated by irrational habits, the body is naturally sensitive to the new diseases to which it is exposed. Even should no specific disease be contracted, there are anæmic tendencies and other degenerative changes. Experience teaches that white men cannot with impunity do hard manual work under a tropical sun, but that they may enjoy fairly good health as overseers or at indoor work, if they take reasonable precautions. Acclimatization in the full sense of having white men and women living for successive generations in the tropics, and reproducing their kind without physical, mental and moral degeneration—*i. e.,* colonization, in the true sense,—is impossible. Tropical disease and death rates, as has been abundantly shown, can be much reduced by proper attention to sanitary laws, so that these rates may be not much, if any, higher than those in the extra-tropics. And with increasing medical knowledge of the nature and prevention of tropical diseases, as well as by means of modern sanitary methods, a white resident in the tropics will constantly become better able to withstand disease. As Manson has put it, acclimatization is less "an unconscious adaptation of the physiology of the individual" than "an intelligent adaptation of his habits." For greater comfort, for better health and for greater success, properly selected hill stations will, however, always be essential to northerners who have to live in the tropics, especially to white women and children.

children.—*The Hygiene of Zones, Bulletin Geographical Society of Philadelphia, January,* 1906.